

Report of Findings

Date of Accident: June 29 2014

Location of Accident: Peachtree City GA U.S.

Aircraft Registration: N957MD

Aircraft Type: Czech Sport / Piper Sport

Engine Type and S/N: Rotax 912 ULS S/N 6776264

NTSB or TSB File Number: ERA14LA316

Date of Report: August 29 2014

File Number: 2014-029

Original Accident Location:

Peachtree GA

Preliminary engine inspection

Inspection carried out at: Atlanta Air Salvage

Date of inspection: August 29 2014

Oversight by NTSB/FAA personnel:

NTSB IIC Paul Cox

ENGINE

Rotax Engine Model Number: 912ULS

Rotax engine serial number: 6776264

OVERVIEW (summery of overall situation including brief description of accident):

NTSB PRELIMINARY REPORT

On June 29, 2014, about 0915 eastern daylight time, a Czech Sport Aircraft Piper Sport, N957MD, was substantially damaged during a forced landing in Peachtree City, Georgia.

The private pilot was seriously injured. Visual meteorological conditions prevailed, and no flight plan had been filed for the local flight from Atlanta Regional Airport – Falcon Field (FFC), Peachtree City, Georgia.

The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91.

Due to the extent of his injuries, the pilot was not able to be interviewed for this report; however, the pilot's wife related from him that there was a loss of engine power but that he didn't know why.

According to a witness, she was watching the airplane take off and it became clear that it wasn't going to clear trees beyond the runway. The airplane veered to the right, like it was trying to turn around, "but fell like a rock nose first into the ground." In a recorded television interview, a golfer who had been with a group on a nearby course stated that he saw the airplane taking off from the airport, and that the engine was "sputtering just like it was out of gas or not hitting on all cylinders."

He thought the airplane was returning to the runway and was headed for some trees when it suddenly turned and dove nose-first into the ground. The golfers raced to the plane to see if anyone survived, and when they arrived, they saw fuel on the floor. "We didn't know if it was going to blow; we wanted to get him out, but he couldn't move; we couldn't get the belt, so we were looking for a knife to cut the belt but it wasn't happening."

One of the golfers then turned the ignition off and removed the keys.

Photographs of the airplane revealed severe front end crushing, and fuel was confirmed in to be in the tanks. The airplane and engine are scheduled to be further examined.

Updated on Aug 26 2014 11:21AM

Initial condition of Engine as presented prior to detailed inspection (summary on initial visual condition)

Engine and aircraft substantially damaged from impact:

- Oil tank crushed
- Oil pump broken at oil filter mounting point
- Oil system breached
- Cross over tube on intake broken
- 1/3 & 2/4 Carburetors displaced
- 3 blade propeller with two blades broken and one blade still attached
- Exhaust system damaged
- Carburetor sockets damaged
- Oil pump filter flange broken from oil pump
- Coolant radiator crushed and breached

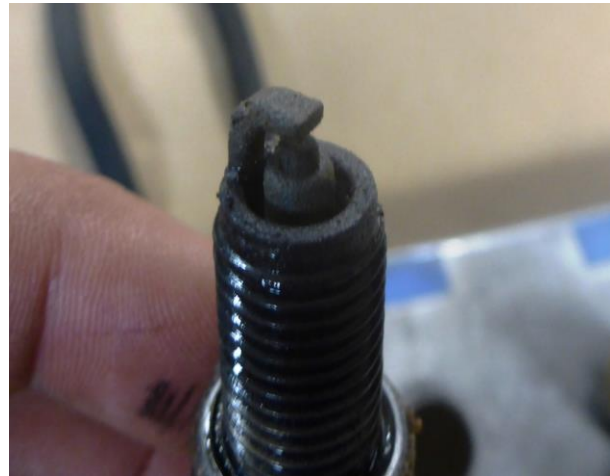
The engine was then removed from airframe by Salvage Personnel and placed on work bench for further examination.



Detailed Engine Inspection

Spark Plugs & Spark plug Caps

All spark plugs were NGK DCPR8E and were found to be in very poor condition. [REDACTED]



Ignition System

The ignition system (plug wires, ignition coils, ignition modules) were visual examined for condition, modifications and proper installation.

No anomalies were found with the ignition system

Fuel System including carb inspection and fuel lines

The aircraft was equipped with an electric fuel pump and a mechanical fuel pump as per Rotax recommendations. The fuel system also incorporated a Gascolator at the low point of the fuel system and the fuel lines were fire sleeved.

No anomalies were found with the fuel system.

Fuel supply including fuel pump

The carburetor float bowls were removed and examined for fuel and contamination. No fuel or contamination was found. The carburetor main jets were examined for the correct size and blockage. The Carburetor main jets were the stock 155 size and no blockages were found.

The tops of the carburetor were dismantled to inspect the condition and configuration of the Jet needle. The Jet needle was in good condition with the needle clip in the stock number 2 position.

The 2/4 carburetor body was damaged from impact and could not be used for any future test run purposes.



The fuel system had two fuel different type of fuel pumps installed. The electric fuel pump was an automotive fuel pump that was tested ok. The mechanical fuel pump was the original fuel pump that came from Rotax P/N 892 542 and was recommended to be replaced as per Rotax S/B 912-063UL due to possible malfunction. This fuel pump was to be replaced with a new style fuel pump P/N 893 115.

Lubrication system

The lubrication system was examined for condition, proper installation and modifications. Due to impact damage, the lubrication system was breached and most of the oil had been drained. There was evidence the engine received proper lubrication throughout.

No anomalies were found with the lubrication system.

Oil filter

The oil filter installed on this engine was a non-approved, non-Rotax oil filter. Rotax Service Letter SL-912-014 R5 states Non-approved modifications or use of Rotax unapproved engine components or accessories for Rotax aircraft engines could result in engine damage, personal injury or death.

This service letter SL-912-014 RT section 3 subsection 3.1.2) Example of a non-genuine ROTAX oil filter specifically states non-genuine ROTAX oil filter are not airworthy and should not be installed or be further used according to ROTAX instructions.

The type of oil filter that was installed on this engine was an aftermarket Tempest Oil Filter P/N AA825706.

The proper and approved oil filter is a Rotax Oil filter P/N 825 012



Cylinder and cylinder head

The cylinder head valve covers were removed to examine for proper oil lubrication to the valve train. Evidence of oil lubrication was found within the cylinder head and valve train.

With the spark plugs removed the engine propeller was rotated by hand to check for thumb compression and continuity.

Good thumb compression was felt and continuity was seen.

No anomalies found within the cylinders or cylinder head.

Cooling system

The cooling system was examined for condition, modifications and proper components. The cooling system was breached due to impact damage seen on the coolant radiator. Most of the coolant had leaked out but evidence of coolant was still found within the coolant expansion tank.

No anomalies found with this coolant system.

Exhaust system

The exhaust system was examined for condition, modifications and proper components. The exhaust system was damaged from impact.

No anomalies were found with the exhaust system.

Gearbox

The gearbox was inspected for condition, modifications, proper components, smooth operation and for any unusual sounds or other discrepancies.

No anomalies were found with the gearbox

Crankcase and crankshaft

The crankcase was visually examined for condition and modifications. The crankcase appeared to be in good overall condition with no anomalies found. The crankshaft was not visually examined as the engine was not completely torn down. The crankshaft was examined by rotating the propeller shaft and establishing continuity throughout the engine

No anomalies found with the crankcase and crankshaft.

Engine Maintenance and Journey Log

No engine maintenance or journey logs were provided during the on-site examination.

Preparation for Engine test Run

The engine was placed on a work bench and all damaged components that would prevent an engine run were removed.

- Most of the engine mount was removed from the engine
- A used, known working 2/3 carburetor from another Rotax 912ULS was installed due to the impact damage that occurred on the original 2/3 carburetor.
- The exhaust muffler was removed, but the remaining exhaust piping were still attached.
- The oil tank was removed
- The coolant radiator was removed
- The ignition wires were modified for safe operation during test run and the original airframe rotary switch was used to start and stop the engine.
- The remaining propeller blade was cut short to evenly match the two broken blades.
- The carburetor air box was removed.
- The fuel system was simplified from the aircraft version with the use of a suction hose from a fuel canister to the fuel pump and the metered return line from the carburetors back to the fuel canister. (See modified fuel diagram in **Appendix A** for a better understanding of modified fuel system for test stand). The original fuel lines were used to complete the test run fuel system.
- The electric fuel pump and airframe Gascolator was not incorporated within this test stand fuel system.

Engine Test Run

A fork lift was used as a makeshift engine test stand and the engine was secured to the forks with the use of ratcheting straps and tie down straps. A battery was connected to the starter of the engine and the rotary switch was turned to start the engine.

The throttles were manipulated by hand and the engine ran for several minutes. The engine ran at several different RPM settings until it was manually shut off by turning the rotary switch to the off position.

There were no anomalies found during the engine test run.



Summary

Due to the impact damage the #2/3 carburetor sustained, it was the only original engine component that could not be tested during the engine run. Even though the internal examination didn't show any obvious anomalies, the actual running condition of the carburetor could not be determined.

The fuel pump tested ok, as it provided the proper fuel pressure to engine in order for it to operate.

The physical condition of the spark plugs were the only anomalies that could be found during the examination and test run of the engine. Even though the engine test ran fine with the original spark plugs, it could not be determined how the condition of the spark plugs would affect the overall performance of the engine during takeoff and cruise.

Rotax maintenance manual states the spark plugs should be inspected and cleaned every 100 hours and replaced every 200 hours. If the use of leaded fuel is more than 30% of the time, then the spark plugs are to be replaced every 100 hours.

No maintenance log books were provided to determine when the spark plugs were last cleaned, inspected or replaced.

APENDIX A

